without materially increasing in force, which was also accompanied by unusually heavy rains in the Gulf States. During the 7 days from the 13th to 19th, Apalachicola, Fla., received 9.67 inches, and during 5 days from the 13th to 16th, Mobile, Ala., received 12.60 inches, Robertsdale, Ala., 9.07 inches, and Spring Hill, Ala., 9.92 inches. The amount at Daphne, Ala., on the 13th and 14th was 13.60 inches, and including the 15th 15.55 inches. The greatest 24-hour rainfall was 7.40 inches at Mobile, Ala., on the 13–14th, large 24-hourly rains occurred in every State in the district. In this region of heaviest rainfall the total for the month was 22.87 inches at Apalachicola, Fla., 23.44 inches at Daphne, Ala., 15.50 inches at Mobile, Ala., and 17.96 inches at Bay St. Louis, Miss.

Heavy rains also occurred in eastern North Carolina in connection with the storm of September 3, the average for the eastern district being 6.65 inches.

The least precipitation, amounting to less than 2 inches for the month, occurred over the Altamaha basin in southeastern Georgia and in a series of counties extending from Hampton to Darlington in South Carolina. The smallest total reported was 0.77 inches at Glennville, Ga. In this section of Georgia, as well as in the extreme northwestern portion, severe drought prevailed from August 16 to September 14. Moderate precipitation also fell over most of the main Peninsula of Florida, bringing the average for that State considerably below normal in spite of the very heavy rainfall over its western prolongation. In all other States in the district the State averages were above normal, with maximum excess in the Mississippi area, +5.24 inches.

In the northern portions of the district the rains occurred in fairly distinct periods from the 2d to 5th, 15th to 22d, and 29th to 30th, the number of fair days averaging about 14 during the month. In the southern part there were only 2 periods of dry weather, a very short one about the 12th and from the 22d to 27th, inclusive, the average number of rainy days being 10.

### MISCELLANEOUS PHENOMENA.

The prevailing direction of the wind was northeast in all the States from Virginia to Georgia, but more nearly east or southeast in the Gulf States. High wind velocities were reported at many stations on the Atlantic coast, namely Charleston, S. C., 62 miles from the northeast on the 9th, Hatteras 74 miles southeast on the 3d, Norfolk 50 miles east and Cape Henry 52 miles east on the 3d. The average hourly wind velocity exceeded 10 miles an hour at Norfolk, Cape Henry, Hatteras, Charleston, Pensacola, and Sand Key.

The average number of clear days for the district was 12, partly cloudy days 8, and cloudy days 10. The amount of sunshine was generally less than the normal for September, the average of 17 stations giving 221 hours of actual sunshine or 60 per cent of the possible amount. The highest percentage was 73 at Charleston, S. C., and the least 44 at Hatteras, N. C., followed by 47 at Montgomery, Ala.

### METEORS.

A number of brilliant meteors were observed during the month in various portions of the district. On the evening of the 4th large meteors were observed at Thomasville, Ga., Pensacola, Fla., and Mobile, and Citronelle, Ala. From the times of appearance and direction of motion it is believed they were the same meteor seen from different points. It was first observed at Thomasville at 7.10 p.m. at an altitude of 30°, moving westward; the tail or streamer was very bright, many colored, and about 10° long. Mr. F. Rust Smith, who observed it at Pensacola, states that the meteor came from the southeast and passed toward the northwest at 7.14 p. m., being visible for about 1 minute. Its head was apparently about 1 foot in diameter, and the tail about 3 feet long, and emitted a pale blue light from the head and yellow from the streamer. The meteor was still quite brilliant when observed some time later at Mobile and Citronelle, Ala.

A fine meteor was also observed on the evening of September 12 over southeastern Virginia. Mr. Kimball, of the Richmond station, furnished the following abstract from a more complete report made by Mr. C. W. Ashby, cooperative observer at Newport News, Va.

At Newport News the phenomenon first appeared in the zenith of a cloudless, moonlit sky as a meteor of moderate brightness at exactly 7.15 p. m., and disappeared four seconds later in a burst of sparks about 10° above the southeastern horizon. The meteor was roughly speaking rectangular in outline, the rear end being drawn out into a short tail, while the head was enveloped and somewhat obscured by a slight haze. A shower of sparks followed the meteor, but no luminous trail such as often accompanies meteors was observed. In its downward flight a white light was emitted which increased in intensity, taking a greenish tint as the meteor reached its point of greatest brilliancy on the completion of the first 45° of arc. The light then changed to a yellowish red which deepened as the lower end of the path was neared.

The meteor is thought to have been one of unusual size, since the various phases of its flight could readily be seen notwithstanding the fact that the full moon was shining directly in the face of the observer.

On the same date a meteor was reported to have fallen in the Broad River, near Corn Island, S.C., by Mr. L. L. Rice, who observed it from launch about a quarter of a mile distant.

### SEVERE LOCAL STORMS.

On September 18, 1913, at 3 p. m., a severe storm with all the characteristics of a tornado visited Conway, Horry County, S. C., causing a loss of about $3,000.

### RIVER CONDITIONS.

The heavy rains in the Gulf States were mostly limited to the lower courses of the rivers and had comparatively little influence on river stages, which remained low throughout most of the month, flood stages not having been attained at any point. In the Carolinas, however, the heavy rains of the 3d and 4th, and again on the 18th and 19th, caused moderate floods for which suitable warnings were issued.

On September 4 warnings were issued by the official at Raleigh for a considerable rise in the rivers of eastern North Carolina. The stages indicated for the Roanoke and Cape Fear Rivers, however, were not above flood stage. The Roanoke at Weldon rose to 26.9 feet on the 6th, and the rise in the Cape Fear River at Fayetteville was from 3 to 24 feet within 24 hours. The overflow of the Tar River was slow and moderate, while that of the Neuse was quick and heavy. On the Tar River flood stages were attained as follows: At Tarboro 20 feet on the 9th (flood stage, 18 feet), at Greenville 15.2 feet on the 10th (flood stage, 13 feet), and in the Neuse River, Neuse reported 18.5 feet on the 4th (flood stage, 12 feet) and Smithfield 19 feet on th 5th (flood stage, 13 feet). The loss to buildings, factories, highways, and bridges was about $10,000, to crops about $5,000, and the loss due to suspension of business was also about $5,000. The money value of the property saved by the warnings was about $10,000.